SODA BUTTE CREEK BRIDGE I
Yellowstone Roads and Bridges
Spanning Soda Butte Creek on
Northeast Entrance Road
Yellowstone National Park
Park County
Wyoming

HAER No. WY-39

BLACK & WHITE PHOTOGRAPHS

WRITTEN HISTORICAL & DESCRIPTIVE DATA

Historic American Engineering Record
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HISTORIC AMERICAN ENGINEERING RECORD

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Location:	Spanning Soda Butte Creek on Northeast Entrance Road, 3.3 miles west of the northeast entrance station, Yellowstone National Park, Park County, Wyoming
Date of Construction:	1936
Owner:	Yellowstone National Park, National Park Service
Use:	Vehicular bridge
Designer:	Architectural plans by W.G. Carnes, Branch of Plans and Design, National Park Service; General plans and specifications by V.C.H., Bureau of Public Roads; L.U. Foreman, Project Engineer, Bureau of Public Roads
Builder:	Strong & Grant, Springville, Utah
Significance:	Soda Butte Creek Bridge I typifies the early design philosophy of the National Park Service, which was to use indigenous materials to harmonize man-made features with their natural surroundings. This philosophy is embodied in many of the park's Rustic Style buildings and structures.
Project Information:	Documentation of Soda Butte Creek Bridge I is part of the Yellowstone Roads and Bridges Recording Project, conducted during the summer of 1989 by the Historic American Engineering Record, a division of the National Park Service, under the co-sponsorship of Yellowstone National Park, the NPS Roads and Bridges Program, and the NPS Rocky Mountain Regional Office, Denver. Historical research and written narrative by Mary Shivers Culpin, Historian, NPS Rocky Mountain Regional Office. Engineering description by Steven M. Varner, Virginia Polytechnic Institute. Edited and transmitted by Lola Bennett, HAER Historian, 1993.

HISTORY OF EAST ENTRANCE ROAD

(See HAER WY-12, Lamar River Bridge.)

DESIGN AND CONSTRUCTION OF SODA CREEK BRIDGE I

Construction of Soda Butte Creek Bridge I was part of a 13-mile modernization project of the old Tower Junction to Cooke City road. The former wagon road did not meet the demands of the increasing volume of tourists who were entering the park on the recently-completed Cooke City to Red Lodge, Montana, road (Beartooth Highway). The major focus of the project was grading and the construction of three bridges, one of which was Soda Butte Creek Bridge, 3.3 miles west of the park boundary at Cooke City.

During the autumn of 1933, A.O. Stinson completed the location survey in which test pits were excavated to determine the nature of foundation material, and samples of the sand and gravel were gathered from several nearby stream deposits.

Plans drawn up during the spring of 1934 were based upon a 24-foot clear roadway, curb-to-curb. Strong & Grant of Springville, Utah, was awarded the contract on September 29, 1934. Due to the awarding the contract so late in the construction season, no work was started in 1934. Toward the end of May, 1936, the contractor established a temporary camp, and the six-man crew began the work on June 1. The first task was to erect a screening and washing plant for the production of concrete aggregate from a large gravel bar near the confluence of Soda Butte Creek and Pebble Creek.

Due to the concurrent construction of three bridges along the project, the bridges were built in stages in order to utilize common equipment and labor on each structure. The staggered construction and lack of adequate manpower resulted in the approaches to the bridges not being finished as soon as the concrete was ready for backfilling. With only a few days needed for finishing the approaches, the project had to be shut down for the winter. The work did not begin again until June 8, 1936.

The crews arrived on June 8, 1936, to complete the approaches only to find that they had settled noticeably. Upon the obliteration of the camp site, the final inspection was completed on July 27, 1936, by C.F. Capes of the Bureau of Public Roads (BPR). The bridge cost a total of $27,967.60. The entire project took a total of 172 days, or 86 percent of the contract's allowable 200 days. The labor for the work was secured through the office of the National Reemployment Service located at Mammoth Hot Springs. Most of the men came from Montana, Wyoming and Idaho. Available unskilled labor was ample, but finding skilled laborers (particularly bridge carpenters) was more difficult.[1]

DESCRIPTION

Soda Creek Bridge I consists of three spans, the center arch span is 46' in length, with flanking half-arch approach spans, each 23' in length. The structure length from end of wing wall to end of wing wall is 165'-4¾". The deck width is 27' while the bridge roadway from curb to curb is 24' wide. The continuous slab, reinforced-concrete superstructure had a substructure of reinforced-concrete gravity-type piers and "U"-type abutments.

The design load of this bridge was 15 tons. This bridge is skewed 30 degrees. There are two concrete girders which form a half-arch with a 112-foot radius on the flanking spans and an arch of the same radius on the center span. The girders measure 2'-8⅝" deep by 18" wide. The top of the girders are form a curb 9" high. The flat slab is approximately 1'-6" thick. The abutment, girder, pier and wing wall form boards were 8' minimum length. They were rough

band-sawed, had staggered vertical joints, and were oiled before the concrete was placed. All exposed concrete was stained with three coats of Copperas.[2]

The guard rail of this bridge consists of 10"-diameter posts, 8'-0" on center. The posts rise 2'-1" above the curb and are sunk into 8"-diameter pipes sunk into the curb and girder. The rail is on the roadway side and is 8" in diameter. It is connected to the posts with a ¾-inch galvanized iron bolt countersunk on the roadway side. The top of the rail is 4" below the top of the posts.[3]

The abutments batter 1:12 on the transverse side and ½:12 on the longitudinal side. The wing walls are 32'-6" long. The abutment has a seat of 2'-6" to receive the girders. The foundation material under the bridge is coarse gravel and boulders with good supporting power. The piers batter ¾:12 on all faces and are 4'-6" wide. They rise about 8' from the ground to the girders.[4]

In 1984 repairs were made to the abutments and deck, the existing pavement was removed and replaced with a 2-inch overlay.[5] A 1986 bridge inspection indicated that Soda Butte Creek Bridge I's general condition is good, with moderate to severe spalling of weather-exposed surfaces.[6]

ENDNOTES

1. L.U. Foreman, "Final Construction Report (1935-1936) on Project NR 8-A1, Bridges, Tower Junction to Cooke City Highway, Yellowstone National Park," 26 March 1937.

2. National Park Service, Branch of Plans and Design, Soda Butte Creek Bridge Architectural Plans, 18 November 1934.

3. Ibid.

4. Foreman, "Final Construction Report (1935-1936) on Project NR 8-A1, Bridges, Tower Junction to Cooke City Highway, Yellowstone National Park".

5. Real Property Record for the Soda Butte Creek Bridge, 1984, Yellowstone National Park.

6. "Parkwide Road Engineering Study, Yellowstone National Park," vol. I, U.S. Department of Transportation, Federal Highway Administration, Western Division, Vancouver, Washington, 1986.